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Final SoCalGas Comments NG Research Initiatives for FY 2020-21

Additional submitted attachment is included below.



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California Energy Commission
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1516 Ninth Street
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Subject: Comments on Staff Workshop to Discuss Proposed Natural Gas Research Initiatives for FY 2020-21, Docket # 19-ERDD-01

Dear Commissioners:

I write on behalf of Southern California Gas Company (SoCalGas) in response to the California Energy Commission's (CEC's) Staff Workshop to Discuss Proposed Natural Gas Research Initiatives for fiscal year (FY) 2020-21 held on January 21, 2020. SoCalGas appreciates the opportunity to comment each year on the CEC's consistently well-conceived natural gas research program: this research is increasingly important as we work to achieve California's greenhouse gas (GHG) emissions reduction goals. SoCalGas believes that a portfolio approach, utilizing all energy sources and technologies to meet our climate goals, will best serve Californians and those that follow our lead. Natural gas and renewable gas (such as hydrogen, synthetic natural gas, and biomethane/renewable natural gas) are clean, reliable, affordable, and resilient sources of energy that should be part of the *solution* to California's energy and environmental challenges.

While there are many differences between the CEC's and SoCalGas' research programs,¹ they are highly complementary, and there are increasingly new opportunities for collaboration among the CEC, the U.S. Department of Energy (U.S. DOE), local air districts, and the national laboratories. The following are a few examples of partnerships from 2019:

- This past summer, SoCalGas commissioned a CEC and U.S. DOE co-funded solar powered waste-to-energy demonstration in the Imperial Valley.²

¹ For example, SoCalGas' technology development efforts support of stationary fuel cells, low-emissions engines and turbines, commercial cooking, indoor air quality, power-to-gas, and artificial photosynthesis.

² San Diego State University NewsCenter. *Solar Research Shimmers in Imperial Valley*. July 1, 2019. Available at: https://newscenter.sdsu.edu/sdsu_newscenter/news_story.aspx?sid=77679

- A solar thermal technology co-funded by CEC, U.S. DOE, and SoCalGas recently graduated to the CEC’s Food Production Investment Program with a commercial project at a Kern County cheese plant.³
- SoCalGas, the Gas Technology Institute (GTI), and the CEC successfully demonstrated a new industrial drying technology that uses far less energy, reduces GHG emissions, and saves money.⁴
- SoCalGas, the GTI, the CEC, and Stone Mountain Technologies commissioned two high-efficiency, ultra-low NOx gas heat pumps that can simultaneously provide hot water and space cooling for a restaurant.

SoCalGas looks forward to sharing the details of its 2021 Research, Development & Demonstration Research Plan with the CEC and other stakeholders through future workshops and an advice letter filing this spring.

To help the CEC finalize natural gas research initiatives for 2020-2021, please consider SoCalGas’ responses to the following questions posed at the workshop. SoCalGas also strongly encourages the CEC to consider doubling the funding for gas research and focus this additional funding on renewable gases, including renewable natural gas and hydrogen.

1. Renewable Energy and Advanced Generation

- Of the three technology areas presented -- renewable hydrogen, biomethane, and geothermal heating and cooling -- is it important to prioritize one in particular?*

Yes, hydrogen should be the top priority. While hydrogen technologies have the broadest and most impactful applications, they are in the earliest stages of development and require the most support. Biomethane is also important to help California decarbonize, however, biogas technology is commercially available and the market is developing.

Geothermal heating and cooling is not a suitable technology for funding through the natural gas research and development program as it relies on electrification. There are sufficient funds under Electric Program Investment Charge program to support electric heating and cooling technologies. It is not appropriate to have gas ratepayers fund electric technology development.

2. Energy Efficiency

- Research Proposal: Examining the Effects of Hydrogen in End-Use Appliances. What should be the targeted building sectors, such as residential, commercial offices, retail, restaurants, institutional, etc.? And why?*

³ Hyperlight Energy. *California Energy Commission Issues Notice of Proposed Award*. March 20, 2019. Available at: <http://www.hyperlightenergy.com/wp/?p=913>

⁴ Sempra Energy. *New Industrial Drying System Promises to Save Water and Reduce Energy Use by 65 Percent*. September 12, 2019. Available at: <https://www.sempra.com/new-industrial-drying-system-promises-save-water-and-reduce-energy-use-65-percent>

The residential market has the largest number of equipment units deployed and the greatest throughput. Therefore, serving the existing equipment stock with a decarbonized fuel supply consisting of hydrogen-natural gas blends can have the greatest GHG emissions reduction impact with the lowest amount of consumer cost and inconvenience.

Industrial equipment is the most difficult (if not impossible) to electrify. Hydrogen blending is a promising decarbonization solution for industrial applications, e.g. food processing, textiles, chemical refining, manufacturing.

Finally, hydrogen-natural gas blends delivered through our existing natural gas system represents a very compelling method for meeting California's winter heating demand while reducing GHG emissions. In 2017, California's peak demand was 8,380 MMcf per day.⁵ Electrifying that demand would require 2,544 GWh/day of electric power and conservatively, more than 100 GW of new wind, solar, and back-up generation capacity, depending on assumptions for electric system efficiencies (transmission and distribution power losses) and availability.

b. What should be the targeted appliances and why?

For hydrogen blending to work at scale and across the natural gas system, we need to understand the potential impacts on all appliances. Recognizing the need for a comprehensive assessment, work is underway by SoCalGas and others to understand hydrogen concentration limits and performance for appliances across the board. Current research suggests that appliances are not the limiting factor as most appliance can accept 10-20% hydrogen today without modification. Compressed natural gas (CNG) vehicle limits are setting the system hydrogen blend levels. For example, Germany has two blend limits, one for areas with CNG fueling and a higher limit for those without fueling infrastructure.⁶ SoCalGas's RD&D Program is conducting research with the University of California, at Riverside and Cummings Westport Inc. to understand what is driving CNG blend limits and how to increase the tolerance of CNG engines for hydrogen blended fuels.

c. Are there sectors or appliances to avoid?

No, please see above. A comprehensive understanding is required to advance hydrogen blending in the natural gas system. The CEC is well positioned to coordinate various research efforts across the State, nation, and globe to help advance hydrogen blending in California.

3. Transportation Research

a. What are some vehicle uses that should be targeted by this initiative?

⁵ 2018 California Gas Report, p.33

https://www.socalgas.com/regulatory/documents/cgr/2018_California_Gas_Report.pdf

⁶ International Energy Agency. *Current limits on hydrogen blending in natural gas networks and gas demand per capita in selected locations*. November 26, 2019. Available at: <https://www.iea.org/data-and-statistics/charts/current-limits-on-hydrogen-blending-in-natural-gas-networks-and-gas-demand-per-capita-in-selected-locations>

Fuel cell electric vehicles (FCEVs) are well suited to help electrify transit fleets. For example, the SunLine Transit Agency in Riverside County is demonstrating a number FCEV buses due to their ability to serve long-range routes, function effectively under extreme temperature conditions, and refuel quickly.

SoCalGas also recommends that service fleets also be targeted. The California Department of Transportation (Caltrans) operates a fleet of over 3,300 light- and medium-duty trucks that are required to travel long distances to support California roads and infrastructure projects and, as such, cannot be served by current battery electric vehicle technology. Development of FCEV products for these applications would provide significant environmental benefit given the size of the fleet and vehicle miles traveled.

b. How can the value of these demonstrations be maximized?

SoCalGas recommends partnering with large fleets, including the Los Angeles County Metropolitan Transportation Authority, the Los Angeles Department of Transportation, and Caltrans, so that the technology demonstrations also serve to de-risk the technology for these potential customers.

4. Energy-Related Environmental Research

a. Research Proposal: “Development of Data-Driven, Actionable Tool and Case Studies to Support Strategic and Equitable Natural Gas Decommissioning”

Natural gas ratepayer funding should not be used to fund research into decommissioning the natural gas system. Decommission portions of the natural gas system will adversely impact rates for the remaining ratepayers using the system. This research does not provide ratepayer benefit and, in fact, will increase energy costs generally.⁷

This research needs to include a cost-effectiveness study (i.e., determine the cost per unit of GHG emissions eliminated) of multiple decarbonization options, including using the natural gas system to deliver: 1) renewable natural gas, 2) hydrogen blended fuel, and 3) pure hydrogen, as well as 4) to provide long-duration, utility scale energy storage to support wind and solar resources.

b. How can California’s natural gas IOUs be effectively engaged in this study? What synergies with IOU priorities and planning could be leveraged to enhance the study?

The research should include a detailed analysis of electric utility impact:

- What transmission and distribution upgrades will be required to the electric grid to support electrification and how will this affect retail rates and customer bills?

⁷ The prevailing cost of natural gas, \$3.00/MMBtu is equivalent to \$00.01/kWh, a fraction of the wholesale cost of electricity (\$00.03/kWh to \$00.07/kWh).

- How will reliability be impacted if residential energy supplies are reduced to a single energy currency, especially given increased wildfire risk, public safety power shutoffs, and seismic issues?
- What will be the GHG emissions impact of decommissioning natural gas systems given the marginal electricity production mix?
- How can renewable gas driven microgrids be used to enhance energy resilience and reliability?

Conclusion

SoCalGas provides these comments to help move California towards meeting our aggressive climate goals in a thoughtful, reasoned, studied, and cost-effective way. We look forward to participating in additional workshops on this subject.

Sincerely,

/s/ Tim Carmichael

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